THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888

No. 33. AUGUST 14th, 1954 VOL. 66.

The Protection of Animals (Anaesthetics) Act

It is a source of great satisfaction to the Association that this Act, the fruit of long years of endeavour, is at last upon the Statute Book. It comes into effect on September 1st, 1954. This is the first time that an Act of Parliament has been inaugurated, drafted, and finally passed through all its stages in both Houses through the initiative of the B.V.A.

The first approach to the matter goes back for the best part of 20 years. The necessity for revising the Animals (Anaesthetics) Act of 1919 became speedily apparent, since an exact observance of its provisions left the veterinarian either in the position of not doing what he knew to be best in the interests of a patient, or of breaking the law. Increasing knowledge of anaesthesia and the elaboration of new techniques and new agents made the anomalies of the Act ever more apparent ; yet in spite of continuous pressure from the Association successive Governments declined to take any effective action.

After years of such disappointment and frustration the B.V.A. decided to create a precedent in its history by drafting its own Bill. A sub-committee of the Parliamentary and Public Relations Committee was appointed, the heads of the Bill were decided upon, and Parliamentary counsel was briefed to prepare the Bill in draft form. When this stage had been reached—some two years ago—a tactical decision had to be made. Would it be useful to bring the Bill before the House even though there was obviously little chance of time being found that Session to see it right through ? It was decided to go ahead. The Bill was introduced by Lord Stamp, and although through his skilful advocacy it was unopposed the discussion in the House of Lords enlightened the Association by disclosing the grounds for previous Governmental reluctance to amend the law. Some modification was then made in the draft Bill before its introduction into the House of Commons comparatively recently.

When a ballot for private members' time was won by the Viscountess Davidson, she most kindly undertook to present the B.V.A. Bill under her own sponsorship. The skill and lucidity with which she did so secured its passage, subject to a few minor but useful amendments. When it passed to the House of Lords the Association was fortunate in again securing the sympathetic interest of Lord Stamp, who made himself responsible for it. His championship ensured its safe passage in the Upper House by almost unanimous vote.

The entire profession is indebted to the Viscountess Davidson, to Lord Stamp, and to the members of the sub-committee for the many hours of work and thought they devoted to the Association's interests, which have at length been so wholly successful.

An explanatory memorandum attached to the Bill makes clear its intentions and effects as follows :—

MEMORANDUM

The Animals (Anaesthetics) Act, 1919, makes it an offence to perform certain operations on horses, bovines, dogs and cats without the use of an anaesthetic. The operations which come within the provisions of that Act are set out in six Schedules, the first three of which contain lists of operations requiring the use of a general anaesthetic and the last three a list of operations requiring the use of a general or local anaesthetic.

This Bill proposes to amend the law so as to provide that henceforward all surgical operations upon animals involving pain (with a few specific minor exceptions) should be carried out under the influence of anaesthesia, it being left to the veterinary surgeon to decide what specific agent he will use, and how it shall be administered.

The Bill accordingly repeals the Animals (Anaesthetics) Act, 1919, except in its application to Northern Ireland and provides (Clause 1 (1)) that any operation which is performed upon any kind of animal without an anaesthetic so administered as to prevent the animal feeling pain throughout the operation shall be deemed to be performed without due care and humanity within the meaning of the Protection of Animals Act, 1911 (under which it is an offence of cruelty to subject an animal to any operation which is performed without due care and humanity).

Clause 1 (2) defines an operation, excludes certain minor operations set out in the First Schedule and Clause 1 (4) excludes operations performed on any bird, fowl, fish or reptile.

Clause 1 (3) gives the Minister of Agriculture and Fisheries and the Secretary of State for Scotland power, after consultation with interests affected, to amend the ages above which the castration of certain animals is to be brought within the Act.

Clause 2 provides that the Act is to come into operation on September 1st, 1954.

The Act itself is worded thus :—

An Act to repeal the Animals (Anaesthetics) Act, 1919, and to extend the provisions of the Protection of Animals Acts in relation to the performance of operations on animals. [July 30th, 1954]

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

Use of Anaesthetics in Operations on Animals

1.—(1) if any operation to which this section applies is performed on any animal without the use of an anaesthetic so administered as to prevent any pain during the operation, that operation shall be deemed for the purposes of the principal Act to be an operation which is performed without due care and humanity.

(2) This section applies to any operation with or without the use of instruments which involves interference with the sensitive tissues or the bone structure of an animal, other than—

(*a*) the making of injections or extractions by means of a hollow needle ; or

(*b*) an operation included in the First Schedule to this Act.

(3) The Minister of Agriculture and Fisheries and the Secretary of State, acting jointly, may, after consultation with the Royal College of Veterinary Surgeons and with such persons appearing to the Minister and Secretary of State to represent agricultural interests as may appear to the Minister and Secretary of State appropriate, by order amend any of the ages specified in paragraph 6 of the said First Schedule ; and any order under this subsection—

(*a*) shall be made by statutory instrument, which shall be subject to annulment in pursuance of a resolution of either House of Parliament ; and

(*b*) may be varied or revoked by a subsequent order thereunder.

(4) This Act shall be construed as one with the principal Act, so, however, that in this Act the expression " animal " shall not include a fowl or other bird, fish or reptile.

(5) In this section, the expression " the principal Act " means—

(*a*) in relation to England and Wales, the Protection of Animals Act, 1911 ; and

(*b*) in relation to Scotland, the Protection of Animals (Scotland) Act, 1912 ;

as amended by or under any other enactment.

Citation, Repeal, Extent and Commencement

2.—(1) This Act may be cited as the Protection of Animals (Anaesthetics) Act, 1954.

(2) This Act and the Acts specified in Part I of the Second Schedule to this Act may be cited together as the Protection of Animals Acts, 1911 to 1954.

(3) This Act and the Acts specified in Part II of the said Second Schedule may be cited together as the Protection of Animals (Scotland) Acts, 1912 to 1954.

(4) The Animals (Anaesthetics) Act, 1919, is hereby repealed.

(5) This Act shall not extend to Northern Ireland.

(6) This Act shall come into operation on the first day of September, nineteen hundred and fifty-four.

First Schedule—Section 1

Excepted Operations

1. Any experiment duly authorised under the Cruelty to Animals Act, 1876.

2. The rendering in emergency of first aid for the purpose of saving life or relieving pain.

3. The docking of the tail of a dog before its eyes are open.

4. The amputation of the dew claws of a dog before its eyes are open.

5. The castration of any male dog before it has reached the age of three months or of any male cat before it has reached the age of six months.

6. The castration of a male animal specified in the following table before it has reached the age so specified, that is to say—

horse	twelve months.
ass or mule	twelve months.
bull	twelve months.
sheep	twelve months.
goat	three months.
pig	seven months.

7. Any minor operation performed by a veterinary surgeon or veterinary practitioner, being an operation which, by reason of its quickness or painlessness, is customarily so performed without the use of an anaesthetic.

8. Any minor operation, whether performed by a veterinary surgeon or veterinary practitioner or by some other person, being an operation which is not customarily performed only by such a surgeon or practitioner.

AN EXPERIMENTAL STUDY OF THE CONTROL OF *STR. AGALACTIAE* INFECTION IN DAIRY CATTLE

BY

I. DAVIDSON, G. SLAVIN AND P. STUART

VETERINARY LABORATORY, MINISTRY OF AGRICULTURE AND FISHERIES

Introduction

Bovine mastitis caused by *Str. agalactiae* is still the major udder infection in most areas in this and other countries. The use of penicillin has reduced its importance greatly, but has not reduced the importance of a bacteriologically sound procedure in milking cows. Moreover, its full control requires expensive laboratory facilities as well as penicillin and there is also the fact that some cows repeatedly resist treatment and, if not removed from the herd, are a constant danger. The disease would be eradicated much more easily and the effect of its re-introduction into a clean herd would be minimised if a practical means could be found of stopping or severely limiting the spread of infection from cow to cow.

Stableforth, Edwards & Minett (1935) showed that it is possible to reduce the incidence of *Str. agalactiae* infection by segregating infected cows or simply by milking them last. These authors comment, however, that the chances of successful eradication are greatly increased if infected cows can be removed within a reasonable time. They state that " the disease does not arise sporadically once all known sources of infection are removed."

Hughes (1953) incriminated the udder washing cloth and the teat cups of the milking machine as the most important agents in the spread of *Str. agalactiae* infection. He suggests that the washing up and handling of contaminated milking apparatus is a likely source of hand contamination in a machine milked herd.

In a survey of herds in Surrey over a five-year period, Wilson (1953) showed that attempts to eradicate *Str. agalactiae* by the use of penicillin are most likely to succeed in herds where neither hand milking nor hand stripping is employed. In an earlier report (Wilson, 1952) he states that the disinfection of cows and buildings had no influence on eradication by this method.

Lancaster & Stuart (1949) were able to infect cows by contaminating the milkers' hands with *Str. agalactiae* mastitis secretion. Infection spread most rapidly when the secretion used for this purpose was very clotted and viscid, and contained large numbers of *Str. agalactiae*. At a later date (Stuart & Lancaster, 1949), after treatment, the same cows were given intramammary infusions of mastitis secretion. Since the degree of susceptibility to infection was unaffected

by the method of exposure, Stuart & Lancaster suggested that the defence mechanism in cows resistant to infection are within the udder rather than in the teat barrier. They pointed out, however, that the primary infection might have caused a change in susceptibility. In a later experiment (Lancaster & Stuart, 1951), they found that, in the majority of cows, susceptibility to infection increases with age and/or previous infection.

Murphy & Stuart (1952) concluded that the inhibition of *Str. agalactiae* by normal, uninfected milk would seldom, if ever, be a significant barrier to *Str. agalactiae* infection. These authors were able to produce mastitis in 9 out of 11 quarters by a single infusion of small numbers of *Str. agalactiae* (35 ± 31) into the teat cavity (Murphy & Stuart, 1953 (i)). When they applied large numbers of organisms to the lower end of the teat canal (Murphy & Stuart, 1953 (ii)), only 7 out of 17 quarters became infected. They concluded that the teat canal represents a barrier which can prevent infection.

It would appear, therefore, that, although very small numbers of organisms are able to set up an infection once they gain access to the teat cavity, much larger numbers have to be applied to the outside of the teat if an infective dose is to pass through the teat canal. It should be possible to control the spread of *Str. agalactiae* if the number of organisms being transferred from an infected cow to her uninfected neighbours is cut down to a sufficiently low level.

The experiments which have been made in the past to examine the progress of herd infection and to limit natural spread, have added much to our information, but some of them are, in certain ways, open to criticism on bacteriological grounds. In our own work we have tried to overcome some of these objections.

When sets of monozygous twins became available, a series of experiments was designed to examine means of preventing spread. A herd of monozygous twins can be divided into two groups of cows which, presumably, resemble each other more closely in their susceptibility to mastitis than two groups of the same number of unrelated cows. The experimentt were designed to investigate what precautions would prevens the spread of *Str. agalactiae* infection in one group, while spread of infection in the other group would indicate that the cows were being exposed to an infection heavy enough for spread to occur. Not only must infection be present, but sufficient infection, either in quantity or in time, must be transferred to a susceptible cow to infect it (Little, 1937). The design and operation of milking machines is such that transfer of infection is certain. During milking, the teat is immersed in a teat-cup for several minutes during which time it is continuously massaged in a possibly infectious environment. A milking machine of some kind is inevitable and handling milking obsolete. High labour costs and unwillingness to endure wearisome work produces a situation in which no other method is possible. The present experiment was designed to show that, provided suitable precautions were taken with the milking units, infection could be successfully controlled, although other means of transfer were present. One can visualise experimental conditions in which these other avenues of infection are controlled, but they would be impracticable outside an experimental unit, whereas a successful method of cleaning or sterilisation of the milking unit should be possible under reasonable farm conditions. In the experiment about to be described, one group of cows was provided with adequately sterilised equipment, so that if infection occurred in these cows it must have been transferred during the washing of the udder, or machine stripping, or from the environment by some other means. It will be shown that the environment was infected. Failure to control infection by the use of sterilised milking units would demonstrate that control of spread was impracticable. The use of steam rather than disinfectant was adopted because destruction of mastitis pathogens with flowing steam was certain and there was no possibility of chemical damage to the teats. In addition, the units were thoroughly washed before steaming.

In experiments in which chemical disinfectants have been used, there is no certainty that disinfection was complete and it is not always clear whether the method or the disinfectant was under test. Any attempts to wash away the disinfectant have obvious bacteriological objections.

Status of Herd

At the beginning of the experiment the laboratory dairy herd consisted of 10 sets of monozygous twins, all in their third lactation, and four other cows in milk. None of the twins had been infected with *Str. agalactiae* before.

Within-set difference in calving date ranged from 0 to 29 days, the average differences being 10·2 days. The calving season extended from October to June, so that there were cows at all stages of lactation when the experiment began.

During the fourth week of the experiment, twin No. 2501 developed an acute, gangrenous, staphylococcal mastitis and this set had to be removed from the cowshed.

The condition of the teats was recorded before the experiment began. There were no teat sores, nor did any develop during the experiment. One set of twins, 2574 and 2575, had very slack teat sphincters and ran milk as soon as preparations were made for milking. Another set, 2357 and 2358, had very tight teat sphincters. Two sets, 2501, 2502, 2390 and 2391 were considered to have moderately tight sphincters. The remaining six sets were considered to be normal in this respect. No. 2356 had a fistula in the middle of the right hind teat.

Plan of Experiment

The cowshed accommodates two rows of 12 cows each. The cows face outwards and access for milking is provided by a central passage.

The twins were divided into two groups. One member of each set was placed on one side of the shed and the other member directly opposite it on the other side (see diagram). The twins were so arranged that half the cows in Group A calved before, and half calved after their twins in Group B.

Animals artificially infected with *Str. agalactiae* (donors W, X, Y and Z) were introduced into the positions shown in the diagram overleaf. Two donors went dry during the course of the experiment and were replaced by others. One donor, 1796, was re-infected two weeks before the experiment ended.

Hand-stripping was not employed. One milking unit was used for each section of six cows. The donor in each section was milked first : the remaining five cows were milked in an order which was changed daily (see diagram) so that each cow was milked immediately after a donor on one day in every five. Donors W and X (and similarly, donors Y and Z) were exchanged daily. It will be seen from the diagram that the milking rota in Group A was one day behind that in Group B. Therefore each cow in Group A was exposed in the milking routine in the same order and after the same donor as its twin in Group B one day later.

Sections one and three were milked by one milker and sections two and four by another.

During the first few weeks of the experiment the milkers washed their hands with soap and water after machine-stripping each cow. From the results of teat and udder swabs it appeared probable that their hands became more

GROUP A

	Cow's number and position in shed	Milking Order 1st day	2nd day	3rd day	4th day	5th day
Section 1	2359	2	6	5	4	3
	2575	3	2	6	5	4
	Donor W	1	1	1	1	1
	2499	4	3	2	6	5
	2572	5	4	3	2	6
	2357	6	5	4	3	2
Section 2	2393	2	6	5	4	3
	2390	3	2	6	5	4
	2394	4	3	2	6	5
	Donor Y	1	1	1	1	1
	2502	5	4	3	2	6
	2356	6	5	4	3	2

GROUP B

	Cow's number and position in shed	Milking Order 1st day	2nd day	3rd day	4th day	5th day
Section 3	2360	6	5	4	3	2
	2574	2	6	5	4	3
	Donor X	1	1	1	1	1
	2500	3	2	6	5	4
	2573	4	3	2	6	5
	2358	5	4	3	2	6
Section 4	2392	6	5	4	3	2
	2391	2	6	5	4	3
	2395	3	2	6	5	4
	Donor Z	1	1	1	1	1
	2501	4	3	2	6	5
	2355	5	4	3	2	6

heavily contaminated during udder washing than during machine stripping. The milkers were then instructed to wash their hands after washing each cow's udder instead of after stripping.

A sterile udder-cloth was used for each cow. At the beginning of each milking a batch of sterile udder-cloths was placed in a bucket of hot water. After a cloth was used it was discarded into a separate bucket.

In Group B the milking units were transferred from cow to cow without any attempt at disinfection. In Group A, a sterile set of teat cups, long and short milk tubes, pulse tubes and claw was used for each cow. By replacing all the parts carrying milk to the bucket, the possibility of the reflux of infected milk into an initially sterile teat-cup was avoided.

METHODS

Sampling

Milk samples were taken weekly just before the afternoon milking. The teats were cleaned with methylated spirit on cotton wool and few c.c. of foremilk were drawn into a McCartney bottle. Rubber gloves were worn during sampling. After sampling each cow, the gloves were washed with soap and water, and thoroughly rinsed in running water.

Teat swabs were taken weekly shortly after the morning milking. Each swab consisted of cotton wool wrapped round the end of a glass rod. The swab was moistened by dipping it into 5 c.c. of sterile milk containing potassium tellurite (1 : 20,000) and boric acid (1 : 500) (Chodkowski & Lancaster, 1949). It was then rubbed vigorously all round the teat with a rapid downward action without holding the teat. The swab was then rotated rapidly in the same 5 c.c. of milk, squeezed against the side of the tube and discarded. Rubber gloves were again worn during sampling.

Udder and tail swabs and swabs from various parts of the milking apparatus were taken similarly.

Hand washing. The milker first rinsed his hands in running water to remove gross dirt, and then scrubbed them in 250 c.c. sterile milk using a sterile nail brush. A sample of the milk was then taken in a McCartney bottle.

Examination of Samples

Milk Samples.—0·1 c.c. of milk was spread on a sheep blood agar plate. This was incubated for 40 hours at 37° C. The milk samples were then incubated overnight (18 hours) at 37° C. After thorough shaking, one loopful of incubated milk was streaked over half the surface of a plate containing Edward's medium with thallium acetate (1 : 20,000). This was then incubated for 24 hours.

Leucocyte Counts were carried out, at least monthly, on the incubated milk samples by the Breed-Prescott method.

Teat Swab Samples.—A loopful of each sample was streaked over half the surface of a blood agar plate. The samples were then incubated and plated on Edward's medium as above.

Hand Washings.—Approximately 10 c.c. of each sample was centrifuged in a conical tube at 3,000 r.p.m. for 10 minutes and the supernatant discarded. A loopful of the sediment was cultured on blood agar as above. Five c.c. sterile milk containing potassium tellurite and boric acid was added to the sediment. The resulting mixture was incubated overnight and cultured on Edward's medium (with thallium acetate).

Water from the Udder Cloth Bucket was treated in the same way as the hand washings.

Identification of Str. agalactiae.—Single colonies were transferred to Todd-Hewitt broth. Test media were inoculated from the broth and the residue was centrifuged and extracted with acid to prepare antigen for the precipitin test.

An organism which fermented trehalose and salicin, failed to ferment sorbitol, mannitol, raffinose and inulin, hydrolysed sodium hippurate, did not reduce a 1 : 20,000 solution of methylene blue in milk, did not split aesculin on Edward's medium and reacted with Group B serum in the precipitin test was identified as *Str. agalactiae.*

First isolations from each site, together with a selection of repeated isolations from each batch of samples, were identified by these methods.

The strain of *Str. agalactiae* used was originally isolated from a field case of mastitis and passaged through cows at this laboratory in previous experiments. It was stored in the dried state. It is β-haemolytic and produces a deep orange pigment. It is, therefore, easily detected on the solid media used even when in small numbers among large numbers of other organisms.

Artificial Infection of Donor Cows.—A single colony from a 24-hour blood agar culture was transferred to Todd-Hewitt broth. This was incubated for 18 hours and diluted 1 in 50 in sterile milk. This dilution was distributed in 1 c.c. amounts in McCartney bottles. To one of these, 9 c.c. of aseptically drawn milk from the cow to be infected was added. Two c.c. of this dilution was infused into each quarter of the cow by teat syphon immediately after the afternoon milking. By this method it was found that each quarter received approximately 1,000,000 organisms. The actual number was checked by performing a roll-tube count on the dilution in sterile milk.

By diluting the culture in milk, only a very small quantity of foreign material was introduced into the udder and any non-specific inflammatory reaction was reduced to a minimum.

Table I
Milk Samples

Group A

Date :	13.7	20.7	27.7	4.8	10.8	17.8	24.8	31.8	7.9
2575	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	++ — — —	++ — — —	++ — — —

Date :	14.9	21.9	28.9	5.10	12.10	19.10	26.10	2.11
2575	++ — — —	++ C — ++ —	++ + ++ —	++ — ++ —	++ — ++ —	++ — ++ +	++ — ++ —	++ — ++ —

Str. agalactiae was not isolated from the milk of any other cow in Group A.

Group B—Section 3

Date :	13.7	20.7	27.7	4.8	10.8	17.8
2360	— — + —	— — — —	— — — +	— — — +++ S	— — — +++ C	— — — ++ C
2574	E — + —	— — ++ —	— — + —	— — ++ C ++	— — ++ ++	— — ++ C ++ S
2500	E E E —	— + E —	— +++ S E —	E +++ S — —	+ +++ S E —	E ++ S E —
2573	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
2358	E E — —	— — — —	E — — —	— ++ — —	— ++ — —	— ++ — —

Date :	24.8	31.8	7.9	14.9	21.9
2360	— — — ++ C	— — — ++ C	— — — ++ C	Dry	
2574	++ C ++ +++ — C	++ C ++ ++ C ++	++ C ++ C ++ C ++	+++ ++ +++ +++ C	++ ++ ++ +++ S
2500	— ++ C — —	— ++ C — —	— ++ C — —	+ ++ C — —	+ ++ C + —
2573	— — — —	— — — —	— — — —	— — — —	— — — —
2358	Dry. Infection eliminated during dry period.				

Date :	28.9	5.10	12.10	19.10	26.10	2.11
2574	++ ++ ++ C ++ S	++ ++ ++ — C	+++ ++ C ++ — C	++ C ++ ++ ++	++ +++ C ++ ++	+++ ++ ++ +
2500	— ++ C — —	E ++ E —	++ ++ C ++ —	++ ++ C ++ —	— ++ + —	— +++ ++ —
2573	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —

Section 4

Date :	13.7	20.7	27.7	4.8	10.8	17.8
2392	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
2391	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
2395	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
2501	— — — —	— — — —	— — — —	— A ++ A + —	Treated and removed	
2355	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —

Date :	24.8	31.8	7.9	14.9	21.9
2392	— — — —	— — — —	— — — —	— — — —	— — — —
2391	— — — —	— — — —	— — — —	— — — —	— — — —
2395	— — — —	— — — —	— — — —	— — ++ —	— — ++ —
2355	Dry				

Date :	28.9	5.10	12.10	19.10	26.10	2.11
2392	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
2391	— — — —	— — — —	— — — —	— — — —	— — — —	E — — —
2395	— — — —	— — — —	+ — — —	— — — —	— ++ — — Dry	++ +++ — —

Number of organisms in 0·1 c.c.
+ = not more than 10
++ = more than 10, not more than 1,000
+++ = more than 1,000
E = organisms detected in enriched sample only.

Clinical Findings :
A = acute: painful swelling of quarter together with general systemic disturbance.
S = sub-acute: painful swelling of quarter without general systemic disturbance.
C = chronic: visible changes in milk, sometimes slowly developing, painless swelling of quarter.

Results of quarter samples arranged in the order LF, LH, RF, RH, from left to right.

Sterilisation of Milking Equipment.—The cows were milked with bucket-type machines. All equipment used for milking was washed and sterilised by steam after each milking. Udder cloths and each complete milking unit (from the teat cups to the pipe joining the main vacuum line) were sterilised in a steam chest. To avoid contamination after sterilisation, the equipment was left in the chest until just before the next milking. Buckets and churns were sterilised on a churn steaming stool and then immediately removed to racks reserved for sterilised equipment.

Milk was pasteurised by blowing steam through it until it reached a temperature of 65° C. This was found to kill *Str. agalactiae*.

It was hoped that this procedure would prevent spread of infection from the washing room to the cowshed.

Results and Discussion

The results are presented in Tables I to IV. The first samples recorded in the tables were taken three days after the experiment began. Weekly samples are recorded until the experiment ended 16 weeks later. A number of other samples were taken from cows showing clinical signs for the first time or to confirm infection in newly-infected animals. These have been omitted from the tables for the sake of clarity.

In Group B, 11 quarters of five cows became infected : six quarters of three cows showed clinical signs of mastitis associated with at least a 40-fold rise in the leucocyte count of the foremilk (the absolute count rose to at least 13,000,000 leucocytes per c.c.) and three of these quarters secreted pus at some stage of the experiment. There was no rise in the leucocyte count of the milk from the five infected quarters which did not show clinical signs of mastitis and three of these eliminated the infection before the experiment ended. In addition, small numbers of organisms were isolated occasionally from seven quarters of these five cows and from the pre-treatment sample of one quarter of cow 2391. Cow 2501 developed a gangrenous staphylococcal mastitis. Quarter samples were taken just before penicillin treatment and, in addition to staphylococci, *Str. agalactiae* was isolated from two of them.

In Group A, only one animal, No. 2575, became infected. Both forequarters were infected and one milk sample for the left fore showed numerous clots. Apart from this one sample there were no clinical signs of mastitis. The leucocyte counts of these quarters rose to a maximum of 13,000,000 per c.c. A single organism was isolated from the left hind quarter on one occasion and a single organism from the right hind on another. Cow 2575 first became infected when donor 1694 was introduced and this donor stood next to her on alternate days. Her twin was the most susceptible animal in Group B and both had very slack teat sphincters. On no occasion was *Str. agalactiae* isolated from the milk of any other cow in Group A.

Of nine cows exposed to contaminated milking units, five became infected. Of nine cows in which the source of infection provided by the milking machine was eliminated, only one became infected, even though these cows were standing on the opposite side of the same cowshed and were milked by the same attendants. Infected milk was unavoidably splashed on the floor each time a cluster was removed from one of the donor cows which stood amongst them. Despite frequent hand-washing during milking, there was also ample opportunity for the milkers' hands to carry infection. *Str. agalactiae* was isolated from seven of the 20 hand washings taken when milking was in progress and from seven of the 68 swabs taken from the milking bucket handles. On one occasion out of 16, *Str. agalactiae* was isolated from the water in which the clean udder cloths had been immersed. No isolations were made from any of the 32 hand washings taken just before milking started.

Table II

Teat Swabs

Group A

	Date :	13·7	20.7	27.7	4.8	10.8	17.8	24.8	31.8
Section 1	2359	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
	2575	— — — —	— — — —	E — — —	— — — —	— — — —	— — — —	— — — —	+ — — +
	2499	— E E E	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
	2572	— — E E	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
	2357	— E — —	E — E E	— — — —	— — — —	— — — —	— — — —		
Section 2	2393	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
	2390	E — — E	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
	2394	E — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
	2502	— — — —	— — — —	E — — —	— — — —				
	2356	E — — —	— — — —	— — — —	— — — —	— — — —	— — — —		

	Date :	7.9	14.9	21.9	28.9	5.10	12.10	19.10	26.10	2.11
Section 1	2359	— — — —								
	2575	— — — —	— E — —	E — — —	— E E —	E E — E	E E E E	E — + —	— — — —	— — — —
	2499	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
	2572	— — — —	— — — —	— — — —	— — — —	— — — —	— — E —	— — — —	— — — —	— — — —
	2357									
Section 2	2393	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
	2390	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —
	2394	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	— — — —	

\+ = organisms isolated from unincubated sample.
E = ,, ,, ,, enriched sample only.

TABLE III
TEAT SWABS

GROUP B

	Date:	13.7	20.7	27.7	4.8	10.8	17.8	24.8	31.8
Section 3	2360	+ + — E	— — — —	+ + + +	— — + —	— E — —	— — — —	— — — —	— E — E
	2574	+ + + +	— — — —	+ — + +	— — — +	— — — —	— — — —	— — + E	E + + —
	2500	+ + + +	E — — —	E + + E	— — — E	— E — E	— — — —	E E — —	E E — —
	2573	+ E + +	— — — —	+ E + E	E — E E	— — — E	— E — —	— — — —	E — E —
	2358	+ + + +	— — E —	+ E + E	E + + —	— E — —	— — — —		
Section 4	Date:	13.7	20.7	27.7	4.8	10.8	17.8	24.8	31.8
	2392	+ — E E	— + — —	+ + + +	— — — —	— E E —	— — — —	— — — —	— E + —
	2391	E E E +	E + — E	+ E E E	— E — —	— — — E	— — — —	— — — —	— — E —
	2395	— — — —	— E — —	+ E E E	— — — —	— — — —	— — — —	— — — —	— — — —
	2501	E — — —	+ + — E	+ + + +	— — — —				
	2355	+ — — —	E + — —	+ E E +	— — — —	— + — —	— — — —		

	Date:	7.9	14.9	21.9	28.9	5.10	12.10	19.10	26.10	2.11
Section 3	2360	— — — —								
	2574	— E — E	E — — —	+ E — +	E E E +	E E — E	E E E E	E E E —	— E — E	E E + —
	2500	— E — —	+ E E —	+ — — E	E E E +	— E — —	— + — —	E + — —	— E E E	E — — —
	2573	— — — E	+ — — +	— — — —	E E E E	— E — —	— — E —	— E — —	E E — —	— E — —
Section 4	Date:	7.9	14.9	21.9	28.9	5.10	12.10	19.10	26.10	2.11
	2392	— — — —	— — — —	— — — —	— — — —	— — — +	— E — —	— — — —	— E — —	+ + + E
	2391	— — — —	— E — E	E — E E	— — — —	— — — —	— — — —	— — — —	— — — —	+ + + +
	2395	— — — —	— — — —	E — — —	— — — —	— — — —	— — — —	— — — —	— — — —	

\+ = organisms isolated from unincubated sample.
E = ,, ,, ,, enriched sample only.

The results of the teat swab examinations (Tables II and III) give some indication of the degree of exposure of each cow. There is a strong correlation between the numbers of *Str. agalactiae* isolated from the teats of the twins and the number of organisms in the donors' milk (see Table IV, page 472).

During the first three weeks of the experiment, when three of the donors were secreting pus in the milk, *Str. agalactiae* was isolated from the enriched teat swab samples of eight cows in Group A. In no case did this exposure result in infection.

On each occasion when a cow became infected, at least one of the donors to which it was exposed was secreting heavily infected milk containing pus. This observation is in agreement with those of Lancaster & Stuart (1949) and Murphy & Stuart (1952–53) which are discussed in the introduction to this paper.

Statistical analysis of the results showed that the difference in the incidence of infection in the two groups was significant at the 5 per cent. level.

The milk yield of the infected cows during the course of the experiment was 10 per cent. less than that of their uninfected twins. The number of cows was, however, too small for this difference to be statistically significant, the difference being scarcely greater than its standard error.

SUMMARY

Nine sets of monozygous twin cows were exposed to infection with *Str. agalactiae* for 16 weeks by introducing four infected cows into the herd.

In Group A, each cow had a sterile teat-cup cluster and milk tube at each milking. One cow became infected in two quarters, one of which showed mild, transient clinical signs of mastitis.

In Group B, two milking units were used and these were not washed or disinfected during milking. Eleven quarters of five cows became infected. Three quarters showed subacute and three showed chronic, clinical signs of mastitis.

Acknowledgments.—We wish to thank Dr. A. W. Stableforth for his encouragement and interest and for his help in preparing this paper. We are indebted to Dr. H. P. Donald and Dr. D. H. McLeod for data on the twins' performances during their first two lactations, and to Mr. F. B. Leech for statistical analysis of the results. Our thanks are also due to Miss K. Dadswell for technical assistance.

REFERENCES

CHODKOWSKI, A., & LANCASTER, J. E. (1949). *J. Comp. Path. Therap.* **59.** 265–275.
HUGHES, D. L. (1953). *Vet. Rec.* **65.** 1–11.
LANCASTER, J. E., & STUART, P. (1949). *J. Comp. Path. Therap.* **59.** 19–30.
———, & ———. (1951). *Vet. Rec.* **63.** 141–145.
LITTLE, R. B. (1937). *Cornell Vet.* **27.** 297–308.
MURPHY, J. M., & STUART, O. M. (1952). *Ibid.* **42.** 537–558.
———, & ———. (1953 i). *Ibid.* **43.** 290–310.
———, & ———. (1953 ii). *Ibid.* **43.** 465–480.
STABLEFORTH, A. W., EDWARDS, S. J., & MINETT, F. C. (1935). *J. Comp. Path. Therap.* **48.** 300–315.
STUART, P., & LANCASTER, J. E. (1949). *Ibid.* **59.** 31–41.
WILSON, C. D. (1952). Private communication.
———. (1953). Private communication.

TABLE IV

DEGREE OF INFECTION OF DONORS' MILK

Donors for sections 1 and 3

Date:	13.7	20.7	27.7	4.8	10.8
968	+++ +++ +++ +++ +++ ++ ++ ++ +++ ++ +++ ++ ++ ++ +++ +++ ++ ++ +	P P P P P P P P P P P P P G P P M M M			
1757	— — — ++ — — — ++ — — — ++ — — — ++ — — —				

Date:	17.8	24.8	31.8	7.9	14.9	21.9
968	++ ++ — ++	M M M M				
1757	— — — ++ — — — ++ — — — ++ — — — ++ — — — ++ — — —					
1694		++ ++ +++ +++ — + — + — ++ — ++ — ++ ++ ++ — ++ ++ +	M M P P M M M G			

Date:	28.9	5.10	12.10	19.10	26.10	2.11
1757	— — — + — — — ++ — — — ++ — — — ++ — — — ++ — — — +					
1694	— ++ ++ ++ — ++ ++ ++ — ++ ++ ++ — ++ ++ ++ — +++ ++ ++ — ++ ++ +					

Donors for sections 2 and 4

Date:	13.7	20.7	27.7	4.8	10.8
2137	+++ ++ +++ +++ +++ ++ +++ +++ +++ + ++ ++ + +++ +++ — — ++ ++ +	P M P P P P P P P P P P P P P G G G G			
1528	+ +++ ++ — ++ +++ ++ — +++ +++ ++ — +++ +++ ++ — — ++ +	G P M P P P P P P P P			

Date:	17.8	24.8	31.8	7.9	14.9	21.9
2137	+ ++ + ++ ++ ++ ++ ++ ++ + ++ + ++ + ++ ++ ++ ++ ++ ++ ++ +	G G G G M M M P M M M M M M M M M M M M M				
1528	— ++ ++ — — ++ +++ — — ++ +++ — — ++ +++ — — ++ +++ — — ++ +	M M M P M P P M P P M G				

Date:	28.9	5.10	12.10	19.10	26.10	2.11
1528	— ++ — — — ++ — — — ++ — — — + — — — ++ — — — ++ — —	M G G M M				
1796	— — — ++ — — ++ +++ — — + — — — ++ — ++ ++ +++ +++ +++ +++ +++ ++	G G M M P P M P P P P				

Number of organisms in 0·1 c.c. + = not more than 10.
++ = more than 10, not more than 1,000.
+++ = more than 1,000.

Nature of fore-milk : P = pus : secretion completely clotted.
G = gross changes : secretion fluid but having no resemblance to milk.
M = mild changes : clots, watery or discoloured milk.

REPORT OF THE DEPARTMENTAL COMMITTEE ON FOOT-AND-MOUTH DISEASE

It had been our intention to publish a full-length review of this Report in this issue of the *Record*. Owing to an urgent call on the professional services of our correspondent the article is slightly delayed and will appear next week.

B.V.A. Annual Congress at Torquay—September 19th to 25th, 1954

Programme

N.B.—All meetings will take place in Torre Abbey unless otherwise stated.

SUNDAY, SEPTEMBER 19th

8.00 p.m.
"At Home," given by the Western Counties Division, B.V.A. at the Palace Hotel.

MONDAY, SEPTEMBER 20th

10.00 a.m.
Civic Welcome by His Worship the Mayor of Torquay followed by opening of Congress by the Rt. Hon. the Earl Fortescue, K.G., P.C., C.B., O.B.E., M.C.

10.30 a.m.
Opening of Exhibition of Surgical Instruments, Drugs, etc., by the President, B.V.A. (Spanish Barn, Torre Abbey).

12 noon
Films, including "Semen Collection in the Boar," "Phagocytosis," and clinical films.

1.00 p.m. LUNCHEON

2.30 p.m. *Main Hall*
Paper : "Meat Inspection Abroad," by Mr. Horace Thornton, B.V.Sc., M.R.C.V.S., D.V.H. (Newcastle upon Tyne).
Openers :
Mr. C. V. Dayus, M.R.C.V.S. (Agricultural Liaison Officer to the High Commissioner for New Zealand) ;
Lieut.-Colonel Rolland O. Scott (U.S.A.F. (V.C.)) ;
Dr. Orlan Hall (Canada).

8.30 p.m.
Civic Reception and Dance, given by the Mayor and Corporation of Torquay in the Marine Spa.

TUESDAY, SEPTEMBER 21st

9.30 a.m.
Coaches for members depart from Torwood Street Garage, Torquay, for Dartington Hall.

10.00 a.m. View Cattle Breeding Station
11.00 a.m. View Parsonage Farm
12 noon View Barton Farm
} In three groups.

1.00 p.m. LUNCHEON

2.00 p.m.
Coaches for ladies depart from Tolwood Street Garage for Dartington Hall.

2.30 p.m.
Paper : "Present Position with Regard to Bovine Mastitis and a Review of Recent Trials of Various Antibiotics for Bovine Mastitis," by Mr. C. D. Wilson, M.R.C.V.S. (Weybridge).
Opener : Mr. J. D. Dunn, M.R.C.V.S. (Wadebridge).

4.30 p.m. TEA, which ladies are invited to join.

5.30 p.m.
Coaches return to Torquay.

2.30 p.m. *For those remaining in Torquay*
Films in Main Hall, Torre Abbey. (Repeat of Monday's showing.)

8.30 p.m.
Ladies Guild Dance at Palace Hotel.

WEDNESDAY, SEPTEMBER 22nd

10.00 a.m. *Main Hall*
Paper : "Myxomatosis," by Mr. J. N. Ritchie, B.Sc., M.R.C.V.S., D.V.S.M. (Tolworth), in collaboration with Mr. J. R. Hudson, B.Sc., M.R.C.V.S. (Weybridge) and Mr. H. V. Thompson, B.Sc. (Tolworth).
Opener : Professor R. E. Glover, M.A., B.Sc., F.R.C.V.S. (Liverpool).
Break for coffee in Exhibition Hall (Spanish Barn)
Followed by *Paper :* "X-ray in Clinical Diagnosis," by Lieut.-Colonel J. Hickman, M.A., M.R.C.V.S. (Cambridge).
Opener : Lieut.-Colonel R. C. Crowhurst, O.B.E., M.R.C.V.S. (Newmarket).

10.00 a.m.
A.G.M. of Ladies' Guild in the Lounge, Torre Abbey.

11.00 a.m. *Small Hall (Adam Room)*
Paper : "The Prevention of Enterotoxaemias of Sheep," by Dr. R. F. Montgomerie, B.Sc., F.R.C.V.S., and Mr. A. Thomson, M.R.C.V.S. (Beckenham).
Opener : Mr. D. Harkness, M.R.C.V.S. (South Molton).

12 noon
Meeting of 1953–54 Council, B.V.A. (Lounge).

1.00 p.m. LUNCHEON

2.15 p.m.
A.G.M. of Association of Veterinary Teachers and Research Workers in the Adam Room, Torre Abbey.

2.30 p.m.
Congress Photograph at Torre Abbey.

3.00 p.m.
Annual General Meeting (Main Hall).

7.00 for 7.30 p.m.
Annual Banquet, with Dancing to follow, at the Palace Hotel.

THURSDAY, SEPTEMBER 23rd

10.00 a.m. *Main Hall*
Paper : "Present Disease Position in the Poultry Industry," by Dr. R. F. Gordon, M.R.C.V.S. (Houghton, Hunts).
Openers : Dr. W. P. Blount, F.R.C.V.S. (London), and Mr. John Reid, M.R.C.V.S., D.V.S.M. (Tolworth).

10.00 a.m. *Small Hall (Adam Room)*
Paper : "Fungoid Infections in Animals," by Dr. G. C. Ainsworth, B.Sc. (Exeter).
Opener : Mr. C. V. Watkins, M.R.C.V.S., D.V.S.M. (Starcross).
Break for coffee in Exhibition Hall (Spanish Barn)

12 noon or immediately following previous paper, *Main Hall*
Paper : "Summary of the Known Functions of the Adrenal Gland," by Mr. J. L. McGirr, B.Sc., M.R.C.V.S. (Weybridge).
Opener : Dr. W. R. Kerr, B.Sc., M.R.C.V.S., D.V.S.M. (Belfast).

1.00 p.m. LUNCHEON

2.30 p.m.
Films, Golf, Tennis, Bowls, etc.

6.00 p.m.
Glasgow Alumnus Dinner at the San Remo Hotel.

6.15 p.m.
Royal (Dick) Alumnus Dinner at the Queen's Hotel.

8.00 p.m.
Theatre bookings have been made at The Pavilion.

FRIDAY, SEPTEMBER 24th

10.00 a.m. *Main Hall*
Short Papers : "Pig Rearing," by Mr. J. W. Reid, N.D.A. (Starcross) ; "Pig Nutrition," by Dr. D. E. Tribe, B.Sc. (Bristol) ; "Pig Diseases," by Mr. H. F. Hebeler (Langport).
Opener : Professor F. Blakemore, D.V.Sc., B.V.Sc., M.R.C.V.S., D.V.S.M. (VICT.) (Bristol).
Break for coffee in Exhibition Hall (Spanish Barn)

11.00 a.m. *Small Hall (Adam Room)*
Paper : "Neoplasia in the Dog," by Mr. E. Cotchin, M.R.C.V.S. (London).
Opener : Mr. J. Allcock, B.V.Sc., M.R.C.V.S. (Bristol).

1.00 p.m. LUNCHEON

2.30 p.m. *Main Hall*
Paper : "Scientific Trends in Milk Production in Great Britain" (with colour film of production methods and research in New Zealand), by Dr. Joseph Edwards (Milk Marketing Board).
Opener : Mr. John R. Currie, M.S., B.Sc., N.D.A., N.D.D. (Dartington Hall).

2.30 p.m. *Small Hall (Adam Room)*
Paper : "Hereditary Conditions in the Dog," by Dr. G. B. Young, M.R.C.V.S. (Edinburgh).
Opener : Miss J. O. Joshua, F.R.C.V.S. (Finchley).

8.30 p.m.
President's Reception and Dance at the Palace Hotel.

SATURDAY, SEPTEMBER 25th

10.00 a.m. *Main Hall*
Closing Meeting of Congress, followed by First Meeting of Council, 1954–55.

The Ministry of Agriculture Exhibit of Specimens of Poultry Diseases and Myxomatosis will be in the Print Room, Torre Abbey throughout Congress Week

ABSTRACTS

An Experimental Investigation of Electro-shock Therapy in Diabetes Mellitus*

Electro-shock treatment has been used since 1952 in the treatment of various diseases in the clinic of the Academy for Military Veterinarians, Ankara.

Treatment of diabetes insipidus in a 13-year-old German sheep dog and of alloxan induced hyperglycaemia in two rabbits has been attempted using electro-shock therapy. In all three animals the current was delivered from forcep type electrodes 3 mm. in diameter across the head, using the following stimulus, 50 cycle A.C., 70 V., 20 ohms for 1 sec.

The dog was treated three times at weekly intervals during which time the blood sugar fell, glycosuria abated, bilateral cataract showed a very definite improvement, and the animal's general condition was restored. After three months there has been no relapse.

Two of a group of rabbits with alloxan induced hyperglycaemia were treated similarly. The treated rabbits showed a fall of blood sugar to 75 to 95 mg. per cent., whereas the control animals showed a blood sugar level of 200 mg. per cent. As a result of treatment the other symptoms have disappeared and after three months no relapse has occurred.

F. R. B.

* **Experimentell-therapeutische Untersuchungen über den Electroshock beim Diabetes mellitus.** Saatcioglu, S., & Atasoy, H. (1953). *Wien. tierarztl. wschr.* **40.** 725–728.

* * * * *

Treatment of Ketosis with Glycerol and Propylene Glycol*

Propionic acid is the normal source of glucose for the ruminant. Ketosis can be defined as lack of glucose. It is, therefore, logical to attempt to make up the deficiency by supplementing ruminal propionic acid. For physiological reasons, pure propionic acid cannot be used, other glucogenic metabolites being preferable.

The author gives the results of therapeutic trials with glycerol and propylene glycol ; and discusses the merits of other metabolites in bovine acetonaemia.

Two thousand two hundred and fifty grammes glycerol were given per rumen-tube followed by subsequent daily or twice daily 500 g. doses by drench, in the drinking water or in the grain. In less severe cases an initial dose of 450 to 700 g. by drench was found adequate with similar repeated doses. Nine cases of varying severity recovered within seven days of initial treatment. Results were based on plasma glucose and ketone values, appetite and milk yield. Comparable results were obtained in seven similar cases using propylene glycol (P.G.). Up to 1,800 g. by tube were given initially and subsequent smaller doses (200 to 400 g.) by drench or in the drinking water. P.G. was not given in the grain as it is less palatable than glycerol.

It was found that the larger doses (over 800 g.) of P.G. caused inco-ordination. They can also cause dehydration by diuresis, thus aggravating a condition already associated with dehydration. Frequent small doses are more desirable and are more readily metabolised.

Sodium propionate is less glucogenic and because of its tendency to produce alkalosis, it is not desirable to step up the dosage. P.G. is probably as effective as A.C.T.H. and merits further trial. The real line of research, however, should be directed into the control of rumen fermentation, since whatever glucogenic agent is used there may be a tendency to relapse when the treatment is withdrawn. The ruminal flora must be able to adapt itself to produce the deficient glucogenic substances otherwise drop in milk yield will result. Control of fermentation should eliminate ketosis and offer a means of improving the milk production.

C. M. E.

* **Treatment of Ketosis with Glycerol and Propylene Glycol.** Johnson, R. B. (1954). *Cornell Vet.* **44.** 6–21.

CLINICAL COMMUNICATION

THE USE OF MODERN CHEMOTHERAPEUTICS IN TUBERCULOSIS

OLIVER G. JONES,
Curator of Mammals, Zoological Society of London

In a previous contribution (*Vet. Rec.* **65.** 453) the writer referred to a cheetah as having suffered two attacks of tuberculosis which were checked on the one hand by streptomycin and Sodium-P.A.S.-dihydrate and on the other hand by Iso-nicotinyl-hydrazide and Sodium-P.A.S.-dihydrate. Two more cases are now submitted.

Case 1.

A two-year-old Wapiti stag suddenly lost weight and collapsed in February, 1953 (Photo A). Nasal swabs and faecal samples both showed acid-fast clusters identifiable bacteriologically as *Mycobacteria tuberculosis*. Treatment consisted of (*a*) administration of I.N.H. 1,500 mg. daily plus 1½ oz. of P.A.S. daily; (*b*) installation of infra-red lamps (Photo B).

The most dramatic improvement of the head and eye, together with uplifting in morale, occurred within 10 days of commencing treatment. This is parallel with the experience of hospitals nursing TB patients on this treatment. A steady improvement continued, and after five weeks a bacterial negative was obtained. Treatment was continued for three months, at which time the beast appeared to have returned to normal (Photo C).

Case 2. (December, 1952—March, 1953.)

An eight-year-old Puma female suddenly lost weight, became depressed (Photo D) and suffered from a constant sibilant cough upon the slightest exertion. Sputum and faeces revealed clusters of *M. tuberculosis* upon bacteriological examination. Treatment consisted of I.N.H. 10 mg. per lb. bodyweight plus P.A.S. 1 dram per 14 lb. in food. Tonics were also administered. The patient showed a rapid improvement in morale, becoming less lethargic and more aggressive (Photo E). After three weeks cultures of material proved negative, and already the patient seemed much better. Treatment was continued until March, when a clinical recovery was apparent (Photo F).

Thanks are due to Dr. Gremeaux, of Roussel Laboratories, for advice and supplies of drugs.

ANIMAL HEALTH TRUST WELLCOME RESEARCH FELLOW

A Wellcome Research Fellowship has just been awarded by the Animal Health Trust to Mr. T. D. Glover, B.Sc., M.R.C.V.S., who is at present working at Cambridge University for his Ph.D. During the tenure of his Fellowship Mr. Glover will direct his researches into factors influencing the formation and composition of semen. The work is intended as a contribution to the diagnosis of male infertility in various species of farm livestock, combined with a physiological study of the male reproductive system.

The work will be done at the School of Agriculture, Cambridge, under Dr. J. Hammond.

Photo A

Photo B

Photo C

Photo D

Photo E

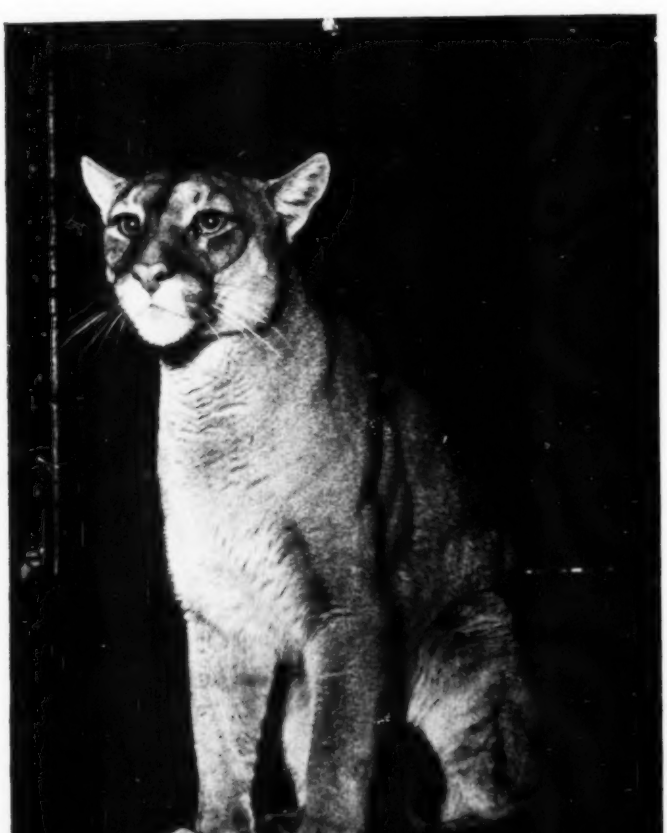

Photo F

REVIEW

[**Microbiology: An Introduction.** By Ernest A. Gray, M.Sc., M.R.C.V.S. Pp. 175. Crosby Lockwood & Son, Ltd., London. Price 12s. 6d.]

How often one comes across the student or student technician who uses the microscope every day, yet has only the haziest idea of the biology of the organisms he examines! It is to provide such a background of general microbiological knowledge in a palatable form for beginners that this book has been written. Consequently its scope has been made as wide as possible; there are chapters on the viruses, bacteria, fungi, algae and protozoa as well as on the general biology and culture of micro-organisms, the host-parasite relationship and various aspects of applied bacteriology. Wisely, the author has avoided placing too much emphasis on medical microbiology and has stressed instead the importance of microbial flora and fauna in everyday life. The chapters on soil and water are good, as might be expected from the author's well-known work in this field, and could be recommended to students reading veterinary hygiene.

In one or two respects, however, students reading this book may receive an unfortunate example. A number of passages seem vague and muddled, a few meaningless. The system of headings is inconsistent, capitals and italics being used almost arbitrarily for main and subsidiary headings alike. Furthermore there are on pages 25 and 81 serious mistakes which need not be quoted here, but which ought nevertheless to have been noticed before publication.

NOTES AND NEWS

Diary of Events

Aug. 25th.—Meeting of the Southern Counties Division, B.V.A., at the Crown Hotel, Blandford, Dorset, 6 p.m.

Aug. 27th.—Summer Meeting of the Eastern Counties Division, B.V.A., at the Red Lion Hotel, Colchester, 11.45 a.m.

Sept. 19th—25th.—72nd Annual General Meeting and Congress of the British Veterinary Association at Torquay.

Nov. 16th & 17th.—B.V.A. Conference on the Feeding of Farm Livestock for Health and Production in the South Hall, Victoria Halls, Bloomsbury Square, London, W.C.1.

* * * * *

PERSONAL

Births.—Claydon.—On July 29th, 1954, at Torquay, to Gillian, wife of Roy Claydon, M.R.C.V.S., Kintail, Barton Hill Road, Torquay, a daughter—Deborah Frances.

Prescott.—On July 31st, 1954, at Arusha European Hospital, Tanganyika, to Anne, wife of J. Graham Prescott, B.Sc., M.R.C.V.S., a son.

Vasey.—On July 28th, 1954, to Margaret, wife of H. F. Vasey, B.Sc., M.R.C.V.S., 16, Elsdon Road, Gosforth, Northumberland—a son, Martin Fairbank.

. . . . .

Engagement.—Steele-Bodger—Murray.—The engagement is announced between Michael Rowland, younger son of the late Mr. Harry Steele-Bodger and of Mrs. Steele-Bodger, of Tamworth, Staffs and Violet Mary St. Clair Murray, only daughter of Mr. and Mrs. G. St. Clair Murray, 34, Kirk Brae, Edinburgh.

Ministry of Agriculture, Veterinary Field Staff.—The Animal Health Division of the Ministry of Agriculture has informed us that Mr. G. L. Henshaw, M.R.C.V.S., Veterinary Officer at Bridgend, resigned on July 31st.

The following transfers have also been made known:—

Mr. G. Durrant, D.V.Sc., D.V.H., M.R.C.V.S., Superintending Veterinary Officer, has been transferred from Heriot to Scottish Office, Edinburgh, as from August 1st, 1954.

Mr. A. M. Urquhart, M.R.C.V.S., on temporary promotion to Superintending Veterinary Officer, has been transferred from Stirling to Edinburgh in charge of Area 22.

Mr. W. Grant, M.R.C.V.S., D.V.S.M., Divisional Veterinary Officer, is now in charge of Area 19 as Superintending Veterinary Officer on temporary promotion.

Mr. A. J. Caldwell, M.R.C.V.S., Veterinary Officer, has been transferred from Uttoxeter to Stafford.

Veterinary surgeons appointed to the permanent staff include:—

Messrs. A. J. Brown, M.R.C.V.S., B.Sc., stationed at Leeds; E. Gallagher, M.R.C.V.S., stationed at Nottingham; E. Jones, M.R.C.V.S., stationed at Welshpool; and S. Simpson, M.R.C.V.S., stationed at Glasgow Port.

* * * * *

APPOINTMENT TO THE MILK MARKETING BOARD

The Minister of Agriculture and Fisheries has re-appointed Sir Frank Ware, C.I.E., F.R.C.V.S., to be a member of the Milk Marketing Board for a further period of three years with effect from July 1st, 1954.

* * * * *

LATE DELIVERY OF THE *RECORD*

The Editor is greatly obliged to correspondents who have been good enough to send post-marked wrappers, most of which show that copies of the *Record* have been delayed in the mail over the whole week-end. The matter is being taken up with the General Post Office in an endeavour to secure more prompt delivery.

* * * * *

SOCIETY FOR GENERAL MICROBIOLOGY

This Society was founded in 1945, and since 1947 has published through the Cambridge University Press the Journal of General Microbiology, and a series of symposia. It has approximately 1,260 members and has now established a permanent office at The Institute of Biology, Tavistock House South, Tavistock Square, London, W.C.1. Enquiries regarding applications for membership and payment of subscriptions should in future be made to this office. Other matters should be communicated to the appropriate officer of the society, and enquiries about the journal made to the Cambridge University Press. All matters regarding meetings are dealt with by the Meetings' Secretary, Dr. E. F. Gale, Department of Biochemistry, Cambridge University. The duties of General Secretary have now been taken over by Professor K. E. Cooper, Department of Preventive Medicine, Bristol University, who succeeds Dr. J. G. Davis. Newly elected members of committee are Dr. B. W. Lacey, Miss June Lascelles and Dr. P. Tate, who succeed Dr. P. W. Brian, Dr. Betty C. Hobbs and Mr. H. Proom. The President, Mr. H. J. Bunker, the Treasurer, Professor R. Lovell, and the two editors of the journal, Professor B. C. J. G. Knight and Mr. A. F. B. Standfast, are the other officers of the Society. The last Annual General Meeting passed a new set of Rules of the Society, which now govern its activities. The 19th General Meeting is to be held at Reading University on September 14th to 16th, and is to include a discussion meeting on "Principles of Microbial Classification."

* * * * *

STORE PIGS FROM NORTHERN IRELAND

The temporary ban on the import of pigs into Great Britain from Northern Ireland, imposed on June 2nd as a precaution against the spread of atrophic rhinitis, was lifted on August 9th. The Ministry is satisfied that as a result of the measures taken by the Government of Northern Ireland there is now no risk of introducing the disease from that country.

DELEGATION TO VISIT RUSSIAN AGRICULTURAL EXHIBITION

The Ministry of Agriculture has accepted an invitation from the Soviet Ministry of Agriculture to send a delegation to visit the All Union Agricultural Exhibition of the U.S.S.R. in Moscow, which opened on August 1st. This is the first exhibition of its kind in the Soviet Union for 13 years.

The delegates will be: Professor Sir James Scott Watson, C.B.E., M.C., LL.D., Chief Scientific and Agricultural Adviser, Ministry of Agriculture and Director General of the National Agricultural Advisory Service; Dr. G. D. H. Bell, B.SC., PH.D., Director, Plant Breeding Institute, Cambridge; Mr. W. H. Cashmore, B.A., N.D.A., Director of the National Institute of Agricultural Engineering; Dr. P. S. Hudson, PH.D., Director, Commonwealth Bureau of Plant Breeding and Genetics, Cambridge; Sir William Ogg, M.A., PH.D., LL.D., Director, Rothamsted Experimental Station.

The delegation will probably be leaving for Moscow this week-end and will be staying for about 10 days. During their stay in the U.S.S.R. they will be the guests of the Soviet Ministry of Agriculture.

* * * * *

SECOND INTERNATIONAL VETERINARY STUDENT CONGRESS

The second International Congress for veterinary students was held at the Ecole Vétérinaire d'Alfort from July 18th till July 31st. Approximately 100 students from Germany, Belgium, Chile, Spain, U.S.A., Finland, France, Great Britain, Holland, Ireland, Italy, Mexico, Norway, Paraguay, Sweden, Syria, Turkey, Uruguay, Venezuela, and Jugoslavia, met in Alfort.

At the inaugural meeting the Minister of Agriculture, M. Roger Houdet, was in the chair, introduced by Professor Bressou, Director of the Veterinary College of Alfort. At all meetings and discussions the chair was taken by the I.V.S.U. President, Patrick K. Rhatigan, from Dublin, assisted by Eric Hooghiemstra, the Vice-President from Utrecht. During the meetings resolutions were made concerning the professional aspects of the Union, independence from other international student movements, student exchange programme and the organisation of international courses during the vacations.

A permanent secretariat has been established with a view to collecting information of international professional interest, providing technical assistance for student exchange and publishing an Information Bulletin. M. Leclerc (France) is in charge of the secretariat which has been established at the Veterinary College of Alfort. It is planned to hold next year's Congress at Utrecht.

* * * * *

UNIVERSITY OF GLASGOW VETERINARY SCHOOL ALUMNUS ASSOCIATION

This year the Annual General Meeting and Dinner of the Association will be held in the San Remo Hotel, Torquay, on Thursday, September 23rd, at 6 o'clock for 6.15 p.m. Tickets may be obtained from Mr. R. N. C. Aitken at the Veterinary School or from Mr. Peter Hastie, Barrow Hill House, Ashford, Kent. It is essential that the members wishing to attend the dinner apply for tickets not later than the first day of Congress since otherwise it is impossible to make satisfactory seating arrangements. Tickets are 13s. each.

* * * * *

UNIVERSITY OF BRISTOL, BRITISH COUNCIL COURSE

A fortnight's course on Artificial Insemination and Breeding Problems was held during July at the University of Bristol Veterinary Laboratory. The course was arranged by the Director of Veterinary Studies, Professor F. Blakemore, D.V.SC., M.R.C.V.S., D.V.S.M., for the British Council, and included lectures, films, demonstrations, visits to insemination centres and farms in the South-West. The course was addressed by a total of 20 lecturers, drawn from a wide field, the opening lecture being given by Dr. J. Hammond, of the University of Cambridge. Visits to the insemination centres at Dartington Hall, Ilminster and Langford were of particular interest and those who attended the course were able to follow the day to day routine of a typical centre by attending the Somerset Cattle Breeders Centre at Langford through the courtesy of the veterinary officer in charge, Mr. J. Stower.

Those attending the course comprised veterinary surgeons, agriculturists and research workers from Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Iraq, Italy, Pakistan, Switzerland and Vietnam, as well as from this country. They were accommodated in the recently completed students' hall at Langford House and throughout their stay, despite language difficulties, many interesting discussions and exchanges of opinion took place.

The British Council organised a number of outings during any free time available and it was felt that the fortnight was very fully and profitably occupied.

* * * * *

AGRICULTURAL RETURNS FOR ENGLAND AND WALES

Provisional results of June 4th, 1954, agricultural census show that the female breeding herd of cattle, cows and heifers in milk and heifers in calf with first calf showed increases compared with a year ago, but dry cows were fewer. Total cattle and calves showed an increase, as also did total sheep and lambs. The total number of pigs increased by 928,000 (24 per cent.) over last June, the total number of breeding sows was 107,000 (19 per cent.) more. Adult fowls showed little change, but fowls under six months have decreased.

* * * * *

MYXOMATOSIS IN ANGLESEY

We are indebted to a correspondent for the following information:—

Myxomatosis, which was first confirmed in Anglesey early in June, is now widespread on the island. It is difficult to motor along some of the by-roads without running over dead or moribund rabbits. On some sections the carcases lie unbelievably thickly—almost forming a carpet. There is little doubt that Anglesey farmers have suffered badly from the devastations of a large rabbit population in the past, and many expect to benefit from the decimation of their numbers. There are some farmers, however, even in the most heavily infested areas, who would have preferred a "cleaner" method of extermination. Concern has been expressed about the exposure of so many putrefying carcases as being contrary to the principles of hygiene, and in particular, their effect in acting as breeding grounds for flies.

There have been many speculations concerning the ultimate effect of myxomatosis on agriculture, but perhaps one of the least expected is that some farmers are experiencing considerable difficulty in cutting their hay because the bodies of dead or dying rabbits clog the blades of their mowing machines.

It has been stated that trappers are immunizing rabbits in hitherto unaffected "pockets," with a view to protecting them from the disease!

* * * * *

FORTHCOMING CONGRESS

THE FEEDING OF FARM LIVESTOCK FOR HEALTH AND PRODUCTION

The B.V.A. is making plans for an Autumn Conference to discuss the feeding of farm livestock for health and production.

It will be held on two consecutive days—Tuesday and Wednesday, November 16th and 17th, 1954—in the South Hall, Victoria Halls, Bloomsbury Square, London, W.C.1.

The Conference will be open to members of the Association and to members of ancillary associations and trade associations. Admission will be by ticket. Arrangements for issue of the tickets will be announced. A full programme will be published in due course.

EUROPEAN FOOT-AND-MOUTH DISEASE COMMISSION

The first meeting of the European Foot-and-mouth Disease Commission, recently formed under the auspices of the Food and Agriculture Organisation, ended in Rome on August 1st when a number of recommendations were put forward.

The Commission is to act in close co-operation with other international organisations, and especially with the International Office of Epizootics, which will, in particular, play a large part as a centre for the collection and dissemination of information about the incidence of foot-and-mouth disease in all parts of Europe. It was considered especially important that an efficient system should be set up for the rapid collection and transmission of information about new outbreaks, togetheer with progress reports on their control.

The importance of studying certain aspects of research in the use of vaccines and other methods of control of the disease was emphasised. Other matters on which recommendations were made included the collection, through FAO, of information on the incidence of foot-and-mouth disease outside Europe, and on the importance of the international meat trade in connection with disease control.

At the special request of the commission the Director-General of FAO, Dr. Cardon, agreed to make available the services of Sir Thomas Daling, senior FAO Veterinary Surgeon, as secretary of the commission, at least during its initial period.

* * * * *

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Kent.—Home Farm, Eastwell Estates, Eastwell, Ashford (Aug. 3).

Lancs.—Langdale Farm, Zealand Conyers, Carnforth (Aug. 3).

FOWL PEST:

Beds.—Brick Kiln Farm, Caddington, Luton (Aug. 5).

Herts.—Cottingham Farm, Bovingdon, Hemel Hempstead. (Aug. 5).

SWINE FEVER:

Beds.—Little Braningham Farm, Streatly, Luton (Aug. 4).

Cambs.—Rosemary Nursery, Coldham's Lane, Cherry Hinton, Cambridge (Aug. 4); The Mill, Caxton Road, Bown (Aug. 7).

Ches.—148, Eastham, Wirral (Aug. 2).

Denbighs.—Moss Cottage, Gresford, Wrexham (Aug. 4).

Devon.—White Cot, Beechdown, Collaton, Paignton (Aug. 5); Little Castore, Two Mile Oak, Abbotskerswell, Newton Abbot (Aug. 7).

Essex.—Mole Hall, Widdington, Saffron Walden (Aug. 7).

Gloucs.—Hillview, Lowbands, Redmarley (Aug. 3).

Herts.—Sty at Gibon's Slaughterhouse, New Road, Watford (Aug. 2); Church Field, Barley, Royston (Aug. 5).

Hunts.—Stocking Fen, Ramsey (Aug. 5).

Lancs.—Plot No. 8 and 9, off City Road, St. Helens (Aug. 3); Gartside Farm, Droylsden, Manchester (Aug. 5); Bleakhill Farm, Windle, St. Helens (Aug. 6); Withins Farm, Withins Lane, Bolton; Waggon Lane Piggeries, Haydock, St. Helens (Aug. 7).

Middx.—Marish Farm, Denham, Uxbridge (Aug. 3).

Monmouth.—Junction Bridge Piggery, Canal Bank, Newport (Aug. 3).

Mont.—Finnant Farm, Adfa, Nr. Newtown (Aug. 4).

Norfolk.—New Inn, Southrepps, Norwich (Aug. 4).

Notts.—Norsendale Farm, Woodlands Drive, Nuthall, Nottingham (Aug. 5).

Salop.—Well Farm, Edgmond, Newport (Aug. 7).

Somerset.—Sykes Farm, Stowell, Yeovil (Aug. 3).

Staffs.—Woodend, Doley, Nr. Adbaston, Stafford (Aug. 3); The Bungalow, Featherstone Lane, Featherstone, Wolverhampton (Aug. 5); Meaford Hall Farm, Stone (Aug. 6).

Sussex.—" Ethelbert," Theobalds Road, Burgess Hill (Aug. 7).

Warwicks.—" Wayside," Whitefields Road, Solihull, Birmingham (Aug. 5); Piggeries, Marshall Road, Shirley (Aug. 6).

Yorks.—Feoffee Common, Barnby Moor, York (Aug. 6).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

A CONTRIBUTION TO THE AETIOLOGY OF FOG FEVER

Sir,—The article which appeared in your issue of July 3rd under the above heading is a valuable contribution to our knowledge of the possible sequelae of the infestation of cattle by lungworms. It must be realised however that the animals included in these experiments appear to have each received *one* initial measured dose of larvae; in most instances this was followed by a second and much larger dose at a later date.

In the cases encountered in practice, calves and adults at pasture consume *daily* doses of larvae, small or large, according to circumstance. These may be taken continuously over long periods or intermittently according to the type of management. It is likely that when young animals are turned into fields adjoining the farmyard or in those in which manure has been stacked, the number of larvae consumed during the first days of freedom may greatly exceed the dosage administered during the experiments described. Apparently the lungs of cattle which died as a result of experimental " fog-fever " contained few or no lungworms. In contrast, in the hoose pneumonia cases encountered in practice their number is legion; worms intertwined congregate in cotton-wool-like masses completely occluding large bronchi and small bronchioles and causing asphyxia.

In calves, affected with hoose, taken off pasture and housed at the first outbreak of coughing, self-cure may become manifest in 21 days, sometimes in less. This is in agreement with the findings in calves experimentally infested with a single dose of larvae. The same calves, turned out after recovery on fresh pastures which have harboured adult cattle, may suddenly exhibit acute symptoms highly suggestive of worm sensitisation. These consist of dyspnoea, depression, protrusion of the tongue and salivation. The power to cough appears to be lost. Emphysema and lung oedema are present and the mortality incidence is high. The writer, many years ago, recorded the death of five six-months-old Guernsey heifers during one night. These had been turned out on to fresh pasture after having been housed in order to combat a mild attack of hoose. An extensive search of their lungs revealed an occasional adult *Dictyocaulus* in two cases and, apparently, complete absence of larvae.

Adult cattle, particularly Guernseys, may show signs of emphysema and coughing on infested land even more definitely than do calves of other breeds. It seems possible that in adult Guernseys some breed or acquired immunity to *D. viviparus* infestation may be present but that in some unknown circumstances this immunity may break down with the liberation of batches of infective larvae which have been possibly " held up " in lymph glands or even in lung tissue. The sequal may be hoose, pneumonia or a sensitisation oedema involving the lungs and often extending into the submaxillary space. The accompanying emphysema may occasionally extend between the layers of the mediastinum and reach the

skin of the neck and withers In connection with the aetiology of "fog-fever" one must recollect that cattle not infrequently become sensitised to substances other than *Dictyocaulus* larvae with the production of a somewhat similar train of symptoms. The season relative to "fog-fever" is also that during which pollen is being inhaled freely by all grazing animals. Certain individual cows may exhibit all the symptoms of "hay fever" at annual intervals and will require housing during this period if serious consequences are to be avoided. Hypoderma larvae, from the moment of their hatching until their emergence from the skin, are quite capable of causing both local and general reactions; the larvae of *H. lineata* are particularly likely to give rise to a sensitisation syndrome in the event of repeated infestations. Certain plants, *e.g.*, St. John's Wort, and some fungi and even moulds such as the "mildew" of hay may produce a set of symptoms indistinguishable from those described as indicating "fog-fever."

The phenomena linking this condition with *Dictyocaulus* infestation appear to differ from those seen in "cuffing pneumonia" which is a more chronic condition which may or may not be the result of lungworm infestation.

Regarding the possibility of rearing worm-free calves indoors, the writer, during the past May, encountered outbreaks of parasitic bronchitis in housed calves on three separate farms. In each instance the hay fed to these had been purchased from the same source. The belief, generally accepted, that sun-dried hay does not carry viable larvae may need to be revised.—Yours faithfully, R. H. Smythe, 6, Peveril Drive, Nottingham.

References

Chronic bovine pneumonia. *Vet. Rec.*, 1929. **9.** 878.

Clinical aspects and treatment of "hoose" (parasitic) and allied conditions in cattle. *Vet. Rec.*, 1937. **49.** 1221.

* * * * *

BACT. PARACOLI IN DOG CARCASES

Sir,—I have read the Clinical Communication by Dr. A. McDiarmid with great interest. I frequently isolate strains of *Bact. coli* and *Paracoli* from the thorax and peritoneum of dog carcases examined in our Diagnostic and Consultative Service and have usually regarded these as *post-mortem* invaders. Recently, however, I isolated a strain of *Bact. coli* in pure culture from the thorax, peritoneum, heart blood and meninges of a five-weeks-old Alsatian puppy which had died in convulsions. This organism gave the biochemical reactions of Typ. *Bact. coli*. It was also examined by Dr. Joan Taylor at Colindale, who found that it could not be typed serologically, but that it did have an antigen in common with some other strains, also untypable, which were associated with infantile diarrhoea and with sickness in an animal.

I shall be most interested to know if other workers have found similar coliform bacilli apparently acting as pathogens in this way.—Yours faithfully, M. Elizabeth Davies, Bacteriologist, Canine Research Station, Kennett, Nr. Newmarket, Suffolk. *August 9th*, 1954.

* * * * *

AVIAN TUBERCULOSIS IN WILD BIRDS

Sir,—I am interested in wild birds, in ecology, and in parasitology and I found pleasure in reading Dr. Luke's record of the occurrence of avian tuberculosis in three species of wild birds.

Dr. Luke's last paragraph appears, however, to imply some fundamental and exclusive association between the avian type of the tubercle bacillus and the barn-door-fowl, from which unfortunate species it may now be spreading to wild birds.

Such a conception appears to me as erroneous and I should like to substitute the notion of this primitive organism as an exceedingly ancient parasite of a large number of avian species. The association probably traces back to an early stage in the exploitation of parasitism as an easy mode of life, and began before the evolution of *Gallus gallus gallus*, who even now, in his wild Asiatic jungle, is no more frequently affected than are many other wild birds. That the unnatural descendants of this species, crowded by man into pestiferous concentrations, should be particular sufferers and should provide centres of dissemination to other avian species has only occurred in the last "split second" of evolutionary time. It makes no difference to the natural occurrence of this organism in a wide range of hosts which continue to become infected through means that have operated for millions of years.—Yours faithfully, E. L. Taylor, Whitenothe, Nr. Dorchester. *August 5th*, 1954.

* * * * *

ASSESSMENT OF BREEDING CAPACITY OF RAMS

Sir,—Some months ago I had an interesting conversation with a member of the New Zealand Rugby Team who was also a farmer and he informed me that it was a regular procedure in that country to have breeding rams examined by a veterinary surgeon, who could assess their breeding capabilities with a very considerable degree of accuracy. This matter seemed worth pursuing and I wrote to a veterinary colleague in New Zealand who has informed me that this is indeed an accepted practice; the veterinary surgeon attends on behalf of the buyer, and the Romney Breed Society will not send its livestock inspectors to rams unless the animals have been previously examined by a veterinary surgeon. Abnormal rams may suffer from the following conditions:—

(1) Balanitis; (2) Scrotal Mange; (3) Mycotic Dermatitis; (4) Cryptorchidism; (5) Epididymitis; (6) Small testicles; (7) Hydrocoele; (8) Mis-shapen testes; (9) Orchitis; (10) Adhesions; (11) Trauma.

After an examination it is usual to find in a group of rams that 70 per cent. may be classified as early breeders, 20 per cent. late breeders and 10 per cent. abnormal.

My informant states that this examination is a very logical and useful procedure and is now being taken up in Australia.—Yours faithfully, H. Thornton, City and County of Newcastle upon Tyne, Veterinary Department, Town Hall, Newcastle upon Tyne, 1. *August 6th*, 1954.

* * * * *

THE LATE PROFESSOR BUXTON

Sir,—Members of the veterinary profession in Ceylon are all very grieved to hear of the sudden death of Professor Buxton.

There are many in Great Britain much more competent to pay tribute to his character, abilities and achievements in the field of veterinary education; speaking personally I like to recall his charming personality and his great hospitality, gifts which seemed to permeate through the College of which he was Principal for so many years.—Yours faithfully, C. A. McGaughey, Professor of Veterinary Science, University of Ceylon, Peradeniya, Ceylon. *June 23rd*, 1954.

* * * * *

RABIES

Sir,—I was amazed to read in your paragraph headed "Rabies in South Africa" page 386 of *The Veterinary Record*, July 3rd, 1954 that "although several Europeans have caught the disease, all have survived." Is this an indication of the toughness of the White South Africans or of some great medical discovery in South Africa? Here in Ceylon, anyone who "catches" rabies inevitably dies.—Yours faithfully, C. A. McGaughey, Faculty of Agriculture and Veterinary Science, University of Ceylon, Peradeniya, Ceylon. *July 28th*, 1954.

Advertiser's Announcement

"Wellcome" Improved Braxy-blackleg Vaccine

Burroughs Wellcome & Co. announce the introduction of "Wellcome" brand *Improved* Braxy-Blackleg Vaccine for the prevention of *Cl. septicum* and *Cl. chauvoei* infections of sheep and cattle. This new vaccine gives a higher level of efficiency than the previously issued formolised whole culture vaccine. The dose is only 2 c.c. for sheep and 5 c.c. for cattle, as against the 5 c.c. for sheep and 10 c.c. for cattle required with the older product.

"Wellcome" Improved Braxy-Blackleg Vaccine is issued in containers of 50 and 100 c.c.